

AMENDMENTS TO THE CLAIMS

1. (Cancelled)
2. (Previously Presented) A biochip cartridge according to claim 6, 24 or 26 wherein said capture binding ligands comprise nucleic acids.
3. (Previously Presented) A biochip cartridge according to claim 6, 24 or 26 wherein said reaction chamber further comprises a gasket to retain fluid in contact with said array.
4. (Cancelled)
5. (Previously Presented) A biochip cartridge according to claim 6, 24, or 26 wherein said reaction chamber further comprises an outlet port.
6. (Currently Amended) A biochip cartridge comprising:
  - a) ~~a reaction chamber configured to minimize the introduction or retention of air bubbles upon introduction of a sample; said chamber comprising:~~
    - i) a substrate comprising an array of electrodes, each comprising:
      - A) a self-assembled monolayer; and
      - B) a capture binding ligand;
    - ii) an inlet port positioned at the bottom of the reaction chamber for the introduction of reagents;
    - iii) an outlet port positioned at the top of the reaction chamber to minimize the introduction or retention of air bubbles upon introduction of reagents and
  - b) interconnects to allow the electrical connection of said electrodes to a processor.
7. (Previously Presented) A biochip cartridge according to claim 6, 24, or 26 wherein said array is on one surface of said substrate.
8. (Previously Presented) A biochip cartridge according to claim 6, 24, or 26 wherein two surfaces of said substrate each comprise an array.
9. (Previously Presented) A biochip cartridge according to claim 6, 24, or 26 further comprising a cap comprising at least one storage well comprising assay reagents.

Claims 10-23. Cancelled.

24. (Previously Presented) A biochip cartridge comprising:
- a) a reaction chamber comprising:
    - i) a substrate comprising a printed circuit board comprising an array of electrodes, each electrode comprising:
      - A) a self-assembled monolayer; and
      - B) a capture binding ligand;
    - ii) an inlet port for the introduction of reagents; and
  - b) interconnects to allow the electrical connection of said electrodes to a processor.
25. (Previously Presented) A biochip cartridge according to claim 6 or 24, wherein said inlet port comprises a valve comprising a semipermeable membrane.
26. (Previously Presented) A biochip cartridge comprising:
- a) a reaction chamber comprising:
    - i) a substrate comprising an array of electrodes, each electrode comprising:
      - A) a self-assembled monolayer; and
      - B) a capture binding ligand;
    - ii) an inlet port for the introduction of reagents, said inlet port comprising a valve including a semipermeable membrane; and
  - b) interconnects to allow the electrical connection of said electrodes to a processor.
27. (Previously Presented) A biochip cartridge according to claim 26, wherein said semipermeable membrane preferentially allows the escape of gas and retains sample fluid.
28. (Currently Amended) A biochip cartridge according to claim 26, wherein said semipermeable membrane comprises polytetrafluoroethyleneporous teflon.
29. (Previously Presented) A biochip cartridge according to claim 26, wherein said semipermeable membrane comprises expanded-polytetrafluoroethyleneGortex™.
30. (Previously Presented) A biochip cartridge according to claim 6 or 26 wherein said substrate comprises a printed circuit board.
31. (Previously Presented) A biochip cartridge according to claim 6, 24, or 26, wherein said capture binding ligands comprise proteins.

32. (New) A cartridge according to claim 6, wherein the inlet port and the outlet port are separated.
33. (New) A cartridge according to claim 6, wherein the inlet port connects to the outlet port.
34. (New) A cartridge according to claim 9, wherein the cap is removable.
35. (New) A method for filling a reaction chamber comprising:  
    providing a cartridge comprising a reaction chamber, an inlet port positioned at the bottom of the reaction chamber, and an outlet port positioned at the top of the reaction chamber;  
    introducing a fluid into the inlet port positioned at the bottom of the reaction chamber;  
    allowing escape of gas through the outlet port at the top of the reaction chamber, thereby filling the reaction chamber without introducing a bubble into the reaction chamber.